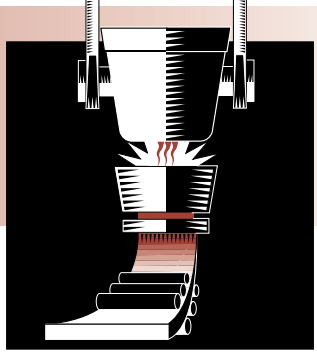
STEEL

Project Fact Sheet



Enhancing the Operation of Highly Varying Industrial Loads to Increase Electric Reliability, Quality, and Economics

Benefits

- Greater control over load swings on the local grid
- Better power quality and reliability
- Reduced power costs

Applications

The results of this project will benefit steel and aluminum manufacturers using electric arc furnaces. Newly developed technologies that enhance the operation of highly varying industrial loads stemming from this project can be applied to multiple arc furnaces and rolling mills, electric systems that supply heavy industrial facilities, and grid areas serving widely varying loads.

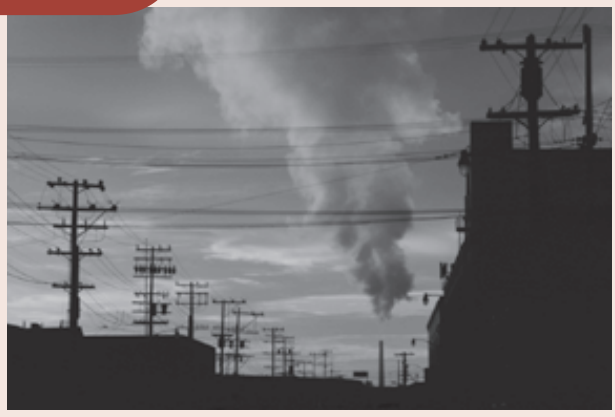
Control of fluctuations of varying industrial loads will enhance operations

The purpose of this project is to develop technologies to enhance the operation of highly varying industrial loads thereby increasing electric reliability, quality, and economics. Specifically, these novel technologies will allow development of methods to control and optimize the operation of industrial loads thereby reducing their contribution to electric system control performance requirements, as specified by the North American electric Reliability council (NERC), as will as properly allocating the ancillary components of unbundled electric service.

The research has now progressed to a point that it can be extended to consider systems that are more representative of electric systems that supply actual heavy industrial facilities as well as issues relating to the evolving energy market place. This effort allows the current effort to be extended by considering other types of loads, specifically multiple arc furnaces and rolling mills. In addtion, it will allow for the development of methods for reducing environmental and energy costs of serving widely varying industrial electric loads while enhancing reliability and power quality.

The approach used will complete the advanced predictive control system that will integrate with multiple existing industrial processes. This system will interface with both existing industrial and utility operations and will not decrease profitability or cause operating concerns. This technique will be extended by merging with ongoing efforts to allocate control responsibility from the level of the control area down to individual loads. A model will be developed that will determine the opitmal appraoch to serving highly varying industrial loads globally from the mutual perspective of the user, energy supplier, ancillary services supplier, and electric grid in general. The result will be an approach in which each of the major energy market players cooperate for their mutual benefit and the reliability benefit of the national electric grid.

Photograph of Industry Power Demand



Project Description

Goal: To develop technologies to enhance the operation of highly varying industrial loads thereby increasing electric reliability, quality, and economics.

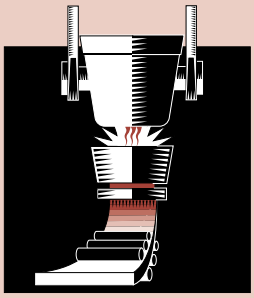
The project will be conducted in five phases over a 30-month time frame. Phase I will be concept development and program planning. Phase II will include development of models for control under several strategies. Phase III will include field tests with Phase IV reporting these tests. Phase V will investigate the impact of combined heat and power (CHP) on control.

Progress and Milestones

Project Start Date: January 2000
Project Completion Date: April 2002

To extend the methodology to rolling mills the following activities were accomplished:

- Literature search for data concerning hot strip mill statistics and operating methodologies.
- Conversations with hot strip mill personnel from Bethlehem Steel Corporation concerning operating practices.
- Initial development of a "generic hot strip mill" specification.
- Basic conceptual design work on the computer simulation model of a hot strip mill.
- Introductory modeling of a hot strip mill simulation prototype model.



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